

# Defect Detection and Prevention (DDP): A Tool for Failure Mode Risk Management

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A principal tool under development in the NASA Failure Detection and Prevention Program (FDPP) is the Defect Detection and Prevention (DDP) tool. Early application of the DDP process has shown great promise in providing project decision makers with the basic information and the methodology required to trade off risk with other resources (e.g., cost, schedule). The optimum combination of Preventative measures, Analyses, process Controls, and Tests (PACTs) can be iteratively determined within various resource constraints, and evolves with the project design process. An optimal resultant combination of PACTs can be determined, which address an appropriate level of accepted performance risk for the active failure modes in the hardware under consideration. The DDP process provides the means to perform ongoing technical and programmatic risk management. The overall DDP concept has previously been described. This paper addresses the implementation process, the latest tool developments, and provides some generalized numerical examples intended to foster a deeper understanding of the DDP process. This paper will also address the relationship between the DDP process and NASA's Risk Balancing Profiles, as well as the utility of the DDP tool for NASA's Integrated Synthesis Environment (ISE) and the Collaborative Engineering Environment (CEE).